

## AGENDA

### FEDERAL REMEDIATION TECHNOLOGIES ROUNDTABLE GENERAL MEETING Wednesday, May 30, 2001

9:30 - 9:45	Welcome and Opening Remarks	Walt Kovalick / EPA TIO
9:45 - 10:00	Chairman's Remarks	Olga Dominguez / NASA HQ

#### PERCHLORATE OVERVIEW & ACTIVITIES

10:00 - 10:20	Overview of Perchlorate Problem	Kevin Mayer / EPA Region 9
10:20 - 10:40	Inter-Agency Perchlorate Steering Committee (IPSC) Activities	Lt Col D. Rogers / USAF
10:40 - 11:00	Ground Water Remediation Technologies Analysis Center (GWRTAC) Perchlorate Report	Diane Roote / GWRTAC
11:00 - 11:30	Roundtable Agencies Perspectives / Issues	Federal Agency Representatives

#### UPDATE ON ROUNDTABLE POLICY AND OPERATION

11:30 - 12:00	Roundtable Business Cost & Performance Status Report Optimization Homepage	EPA TIO
12:00 - 12:10	Remediation Technologies Matrix Update	Richard Williams/USAEC
12:10 - 12:30	DNAPL Strategy Update	Skip Chamberlain / DOE

12:30 - 1:30 **LUNCH**

#### PERCHLORATE - REGULATORY OVERVIEW

1:30 - 1:50	Regulatory Overview	Karen Wirth/Rachel Sakata/ EPA/OW
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#### PERCHLORATE - TREATMENT TECHNOLOGIES

1:50 - 2:20	IPSC - Technology Subcommittee/Air Force	Maj Jeff Cornell / AFCEE
2:20 - 2:40	SERDP/ESTCP	Jeff Marqusee/ DoD ESTCP
2:40 - 3:00	NASA - JPL	Richard Zuromski / JPL -Navy/NFESC

3:00 - 3:15 **BREAK**

3:15 - 3:35	Navy	Mario Dumenigo/NAVFAC
3:35 - 3:55	EPA	Kevin Mayer / EPA Region 9

3:55 - 4:20	DISCUSSION - PERCHLORATE	ALL
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#### WRAP UP

4:20 - 4:30	DISCUSSION - Next Meeting (Suggestions include: bioavailability, unexploded ordnance, <i>in situ</i> sensors, sediments, and fractured rock.)	ALL
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4:30 **ADJOURN**

# The Perchlorate Partnering Project



## Federal Remediation Technology Roundtable

May 29, 2001  
INFORMATIONAL BRIEFING



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## What is Perchlorate?

- Primary Oxidizer in Solid Rockets
  - Titan, Minuteman, Peacekeeper, Hawk, Polaris, Space Shuttle
  - Army, Navy, Air Force, NASA
- Neither Sinker Nor Floater
- Very Stable in Water

Interagency Perchlorate Steering Committee



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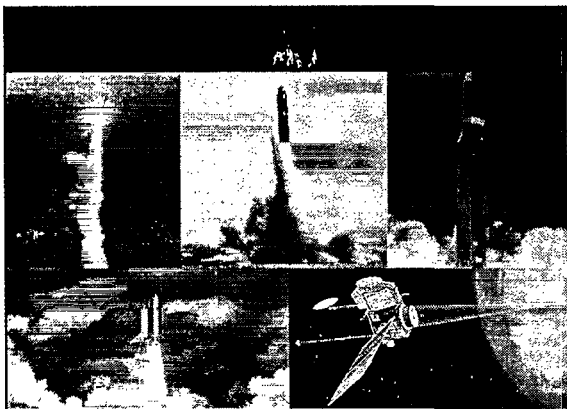
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## Other Uses

- Medicine
- Explosives
- Flares
- Fertilizer
- Ammunition

United States Perchlorate Steering Committee



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## The Perchlorate Contamination Challenge

Credible Science



Credible Decisions

- Accurate risk characterization
- Appropriate management strategies



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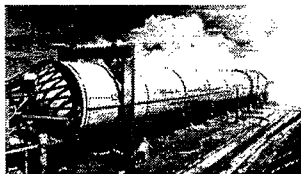
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## Perchlorate-tainted wells spur government action

The discovery in 1997 of perchlorate-contaminated drinking water in the western United States has spurred an interagency federal task force to tackle the health implications of this finding. The belief that perchlorate could be detrimental to humans at levels found in some sources throughout the United States is driving the action, but the work is challenging. In addition to the paucity of environmental fate and toxicity information on perchlorate, there is, as yet, no proven method for removing the compound from water.



Perchlorate, a primary ingredient in solid rocket fuel, must be regularly replaced in the nation's missile and rocket inventory. It is a contaminant in groundwater and surface waters in 14 states. (Courtesy NASA)

Environmental Science and Technology / News, May 1, 1998

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## Purpose of the Partnering Initiative

- Gather together the leading experts currently working on the perchlorate issue
- Provide the public with real-time information on perchlorate projects
- Listen to public concerns
- Get up to date scientific information to the decision makers and public




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## Inter Agency Perchlorate Steering Committee (13 Jan 98)

- Purpose
- Sub Committees to address critical areas
- Membership
  - Federal and State Governmental Agencies
  - Tribal Representatives
- Meetings Open to Public
- Coordinate with AWWA-RF
- Public Stakeholder Forum




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## Inter-Agency Perchlorate Steering Committee

<b>Executive Committee</b> Catherine M. O'Swery (EPA-OSWER) Keith Mayo (EPA-OLM) Col. Dan Rogers (DoD-USAF) Anne Jarabek (EPA-NCEA) Mike Honeycutt (EPA-OW)	<b>Ecological Impacts (EPA)</b> Mike Springer (EPA-OERR) David Long (DoD-USAF)
<b>Health Effects/Toxicity</b> Dave Arife (EPA-ISA) Anne Jarabek (EPA-NCEA) Mike Honeycutt (EPA-OW) Alice Johnson (EPA-OW)	<b>Analytical</b> David Arife (DoD-USAF) Howard Okamoto (CA-DHS) Steve Chubb (DoD-USAF)
<b>Communications</b> Catherine M. O'Swery (EPA-OSWER) Anne Jarabek (EPA-NCEA) David Arife (DoD-USAF) David Spitzer (EPA-OW)	<b>Public Review</b> David Arife (EPA-OSWER)
	<b>Treatment Technology</b> Catherine M. O'Swery (EPA-OSWER) David Arife (DoD-USAF)

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## Update

- As of 15 May 2001
  - 95% of Data Delivery to EPA
  - Expect Peer Review in Fall 01
  - Outstanding Data
    - Occurrence Information
    - Eco System Site Specific Analysis
    - Farm Gate

Inter-Agency Perchlorate Steering Committee




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## Contact

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Table 2-2. Proposed remedies and treatment technologies for ground water contaminants at LLNL Site 300. (continued)

Ground water contaminant	Operable unit	Proposed remedy	Proposed treatment technology
High Explosive Compounds	HE Process Area Building 845/Pit 9	Extraction Monitoring	GAC Not applicable
TBOS/TKEBS	Building 834	Extraction	Oil-water separation, GAC polish

**Notes:**<sup>1</sup>Biotreatment for perchlorate may include bioreactors or CMBS.<sup>2</sup>Biotreatment for nitrate may include phytoremediation, CMBS, bioreactors, or other biotechnology.<sup>3</sup>**Proposed Treatment Technology for Perchlorate in Extracted Ground Water:**

The proposed method for removing perchlorate from extracted ground water is sequential treatment by granular activated carbon (GAC), followed by biotreatment, followed by ion exchange. GAC is the initial step in the treatment process, and will remove organic compounds and some portion of the perchlorate. Following GAC treatment, biotreatment will either employ plants (phytoremediation), denitrifying bacteria (bioreactor), or a combination of the two (cascading modular biotreatment system, CMBS). The CMBS is a containerized wetland harboring denitrifying bacteria that receive the required carbon sources from plant exudates and plant debris. In the bioreactor and other engineered biotechnologies, nutrients are added externally to foster microbial activity. Biotreatment is the primary process for removal of perchlorate from ground water. Ion exchange resins are used as the final, polishing step. Exhausted resin will be disposed of offsite because regeneration is difficult and not cost-effective.

As of February 2000, two different biotreatment strategies for removing perchlorate from ground water have been tested successfully at LLNL. In August of 1999, a two-stage, fixed-film bioreactor (BTU-1) reduced influent concentrations of both nitrate (18 mg/L) and perchlorate (33  $\mu$ g/L) to non-detectable levels, when operated at a flow rate equivalent to a hydraulic residence time (HRT) of about 24 hours. Similarly, a test conducted in October of 1999 showed that the proposed containerized wetland system (CMBS) can reduce influent concentrations of both nitrate (80 mg/L) and perchlorate (44  $\mu$ g/L) to non-detectable levels using an HRT of 96 hours. According to these test results, the bioreactor is most suitable for treatment of ground water at intermediate (2-5 gpm) to high flow rates (>5 gpm) whereas the containerized wetland system is more attractive for intermediate to low-flow situations (< 5 gpm).

**Abbreviations:**

MNA Monitored Natural Attenuation  
 GAC Granular Activated Carbon (aqueous-phase)  
 CMBS Cascading Modular Biotreatment System  
 IX Ion exchange